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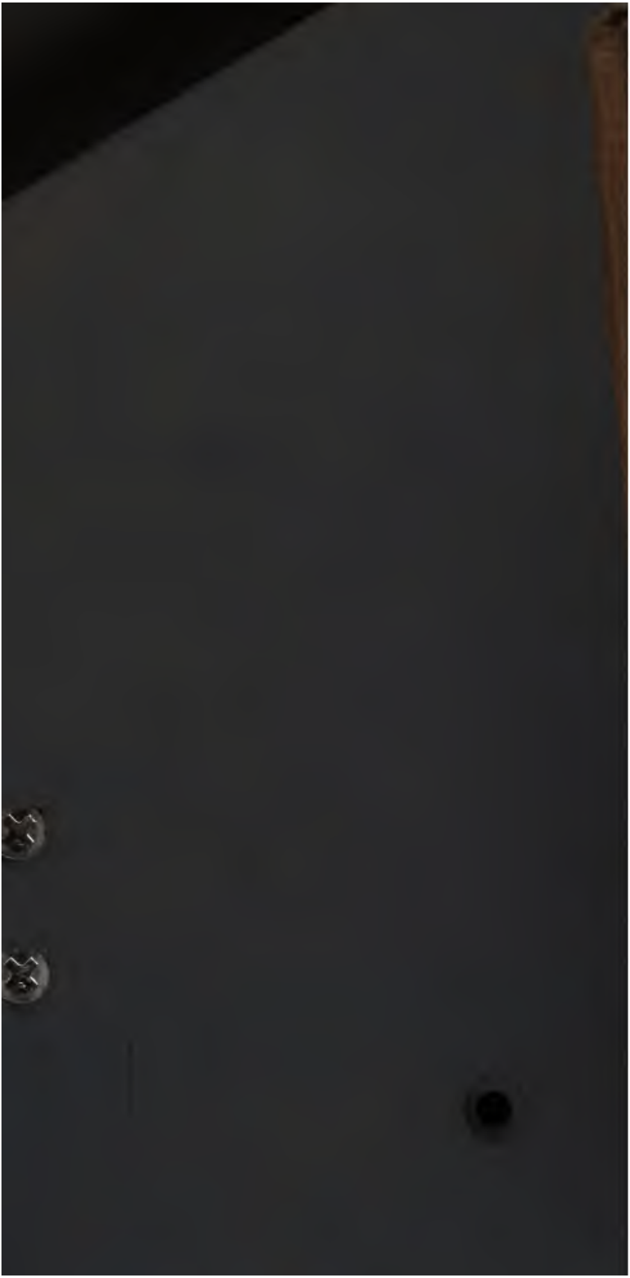

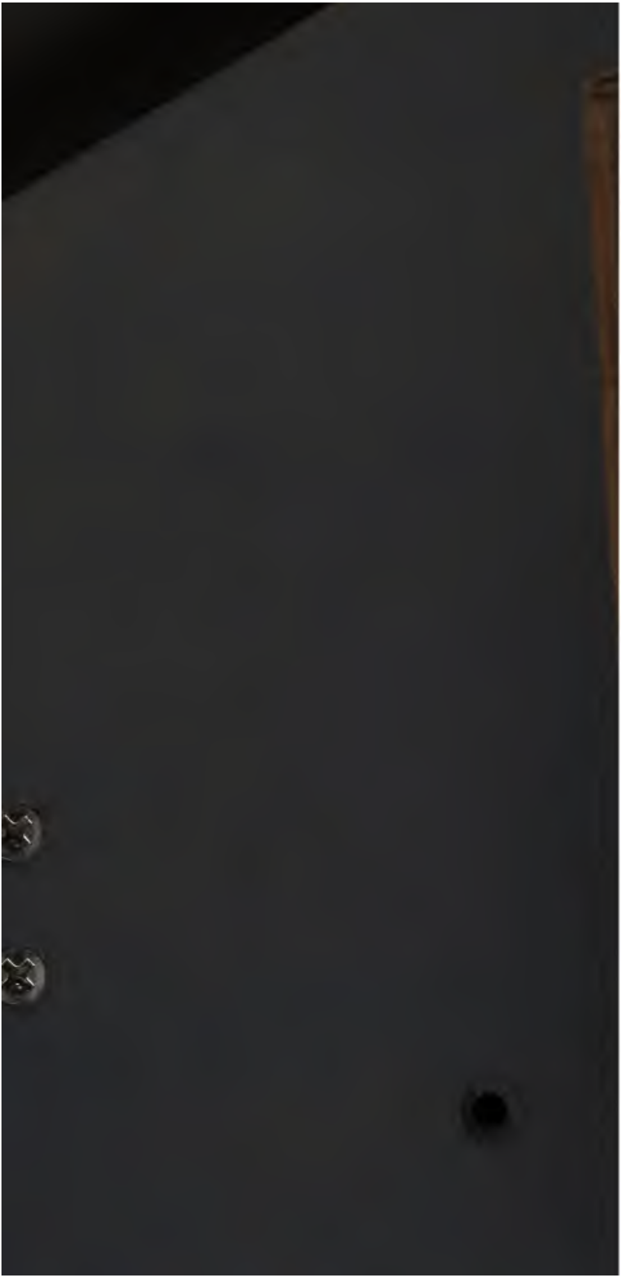

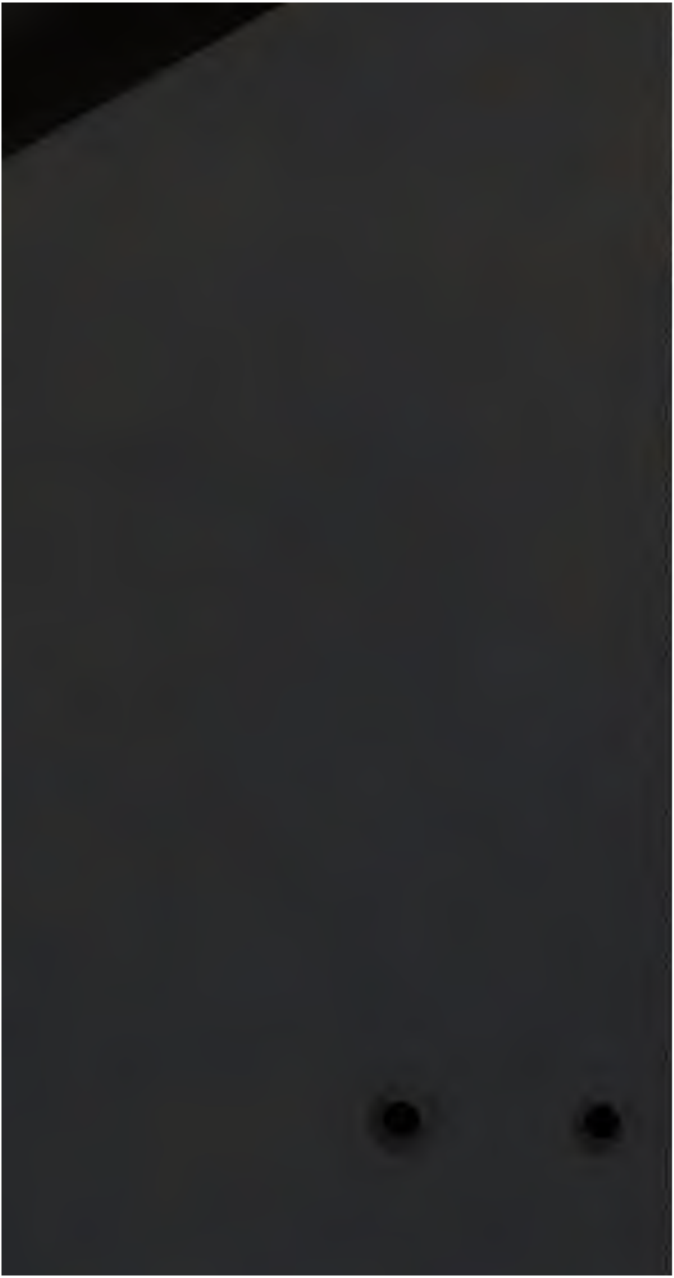

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THE

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PART FIRST,

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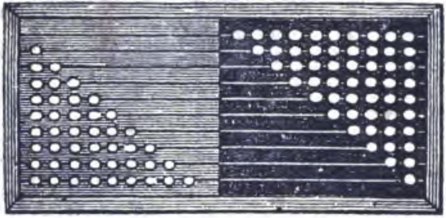

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JANUARY 25, 1924

EMERSON'S FIRST PART.

THE

NORTH AMERICAN

ARITHMETIC.

PART FIRST,

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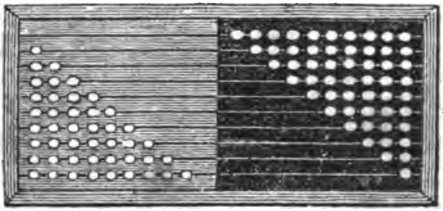
ELEMENTARY LESSONS.

BY FREDERICK EMERSON,

PRINCIPAL OF THE DEPARTMENT OF WRITING AND ARITHMETIC,
BOYLSTON SCHOOL, BOSTON



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1835.

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DISTRICT OF MASSACHUSETTS, to wit, DISTRICT CLERK'S OFFICE.

BE IT REMEMBERED, that on the twenty-eighth day of August, A. D. 1829, in the fifty-fourth year of the Independence of the UNITED STATES OF AMERICA, *Lincoln & Edmands* of the said District, have deposited in this office, the title of a book, the right whereof they claim as proprietors, in the words following, to wit:

"Emerson's First Part. The North American Arithmetic. Part First, containing Elementary Lessons." By Frederick Emerson, Principal of the Department of Writing and Arithmetic, Boylston School, Boston.

In conformity to the act of the Congress of the United States, entitled, "An act for the encouragement of learning, by securing the copies of maps, charts and books, to the authors and proprietors of such copies, during the times therein mentioned:" and also to an act, entitled "an act, supplementary to an act entitled an act for the encouragement of learning, by securing the copies of maps, charts and books to the authors and proprietors of such copies, during the times therein mentioned; and extending the benefits thereof to the arts of designing, engraving and etching historical and other prints." JOHN W. DAVIS,

Clerk of the District of Massachusetts.

PREFACE TO PART FIRST.

IN a systematic course of general education, Arithmetic claims a place among the primary objects. Its elementary exercises, when rationally conducted, are adapted to the capacities of children at a very early age. Its influence on the character of children, in developing the reasoning faculties, and habituating the mind to investigation, is highly conducive to progress in every other branch of knowledge. Notwithstanding the obvious truth of the above remark, the practice of postponing arithmetic till pupils arrive at the age of *nine* or *ten* years, still prevails in a great part of our country, and calls for the attention of those, to whom the concerns of popular education are intrusted.

The purpose of this Manual is, to facilitate the instruction of the younger classes in common schools. It contains the first part of *a Course of Exercises in Arithmetic*, which is to be published in *three parts* The plan of the lessons accords with the method of instruction practised in the school at Stantz, by the celebrated Pestalozzi. The method of illustration, by the use of cuts, and the location of unit marks under questions, it is hoped, will be found to be an improvement.

PART FIRST has been confined to the simple elements of arithmetic, with a view of rendering it a suitable introduction to the subsequent study of the science from books, which are already in use, and which are thought to be deficient in elementary exercises.

The slate and pencil are not required, in the performance of the lessons contained in Part First. On the title page, will be seen, a drawing of an improved structure of the *Abacus*. It is a convenient apparatus for illustrating the combinations of numbers, and may be used in connexion with these lessons, although it is not indispensable.

F. E.

Boston, August 20, 1829.

☞ The Publishers of this book have had the pleasure to learn, that it is recommended by all the Masters of the Departments of Writing and Arithmetic, in the City of Boston; and, that the Boston School Committee have ordered its introduction into the City Schools, to be used by all the pupils as early as they are able to read.

ARITHMETIC.

NUMERATION.

Note to Teachers. All the lessons in Numeration, are designed to be performed while the learners have their books open.

LESSON I.

Here is the picture of some apples : count them.

One, two, three, four, five, six, seven, eight, nine, ten.

LESSON II.

Count the stars in each line across this page.

✳

✳ ✳

✳ ✳ ✳

✳ ✳ ✳ ✳

✳ ✳ ✳ ✳ ✳

✳ ✳ ✳ ✳ ✳ ✳

✳ ✳ ✳ ✳ ✳ ✳ ✳

✳ ✳ ✳ ✳ ✳ ✳ ✳ ✳

✳ ✳ ✳ ✳ ✳ ✳ ✳ ✳ ✳

✳ ✳ ✳ ✳ ✳ ✳ ✳ ✳ ✳ ✳

LESSON III.

How many stars are one star and one star?

✻ ✻

How many stars are two stars and one star?

✻ ✻ ✻

How many stars are three stars and one star?

✻ ✻ ✻ ✻

How many stars are four stars and one star?

✻ ✻ ✻ ✻ ✻

How many stars are five stars and one star?

✻ ✻ ✻ ✻ ✻ ✻

How many stars are six stars and one star?

✻ ✻ ✻ ✻ ✻ ✻ ✻

How many stars are seven stars and one star?

✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻

How many stars are eight stars and one star?

✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻

How many stars are nine stars and one star?

✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻ ✻

Note to Teachers. The design of the preceding lessons has been, to teach the names, and the comparative magnitude of numbers, from *one* to *ten*. The teacher should now inform the pupils, that numbers are represented by FIGURES. He may direct them, to obtain the names of the figures by counting the unit marks, (from left to right,) which stand against the figures severally, in the following table. As this exercise will tend to fix a mental association of each figure with the number of units, which it represents, the lesson should not be omitted, even by children, who are already able to read figures.

LESSON IV.

| 1

| | 2

| | | 3

| | | | 4

| | | | | 5

| | | | | | 6

| | | | | | | 7

| | | | | | | | 8

| | | | | | | | | 9

| | | | | | | | | | 10

Note to Teachers. **The purpose of the following lesson is, to teach *Counting*, and *Reading Figures*, as high as one hundred. It will easily be effected, by exercising the learners in reading the numbers, written in columns; and, at the same time, leading them to observe the analogies, *two—twenty; three—thirty; four—forty;* &c.**

LESSON V.

1 One,
2 two,
3 three,
4 four,
5 five,
6 six,
7 seven,
8 eight,
9 nine,
10 ten,
11 eleven,
12 twelve,
13 thirteen,
14 fourteen,
15 fifteen,
16 sixteen,
17 seventeen,
18 eighteen,
19 nineteen,
20 twenty,
21 twenty-one,
22 twenty-two,
23 twenty-three,
24 twenty-four,
25 twenty-five,
26 twenty-six,
27 twenty-seven,
28 twenty-eight,
29 twenty-nine,
30 thirty,
31 thirty-one,
32 thirty-two,
33 thirty-three,
34 thirty-four,
35 thirty-five,
36 thirty-six,
37 thirty-seven,
38 thirty-eight,
39 thirty-nine,
40 forty,
41 forty-one,
42 forty-two,
43 forty-three,
44 forty-four,
45 forty-five,
46 forty-six,
47 forty-seven,
48 forty-eight,
49 forty-nine,
50 fifty,
51 fifty-one,
52 fifty-two,
53 fifty-three,
54 fifty-four,
55 fifty-five,
56 fifty-six,
57 fifty-seven,
58 fifty-eight,
59 fifty-nine,
60 sixty,
61 sixty-one,
62 sixty-two,
63 sixty-three,
64 sixty-four,
65 sixty-five,
66 sixty-six,
67 sixty-seven,
68 sixty-eight,
69 sixty-nine,
70 seventy,
71 seventy-one,
72 seventy-two,
73 seventy-three,
74 seventy-four,
75 seventy-five,
76 seventy-six,
77 seventy-seven,
78 seventy-eight,
79 seventy-nine,
80 eighty,
81 eighty-one,
82 eighty-two,
83 eighty-three,
84 eighty-four,
85 eighty-five,
86 eighty-six,
87 eighty-seven,
88 eighty-eight,
89 eighty-nine,
90 ninety,
91 ninety-one,
92 ninety-two,
93 ninety-three,
94 ninety-four,
95 ninety-five,
96 ninety-six,
97 ninety-seven,
98 ninety-eight,
99 ninety-nine,
100 one-hundred

Note to Teachers. **The pupils having been accustomed to consider each line of units separately, it will now be necessary for the teacher, to give them an example of continuing the count from line to line. He should, also, instruct them to take into one view, all the lines of stars, which they count, in order to obtain a just idea of the number.**

LESSON VI.

* * * * * * * * * *
* * * * * * * * * *
* * * * * * * * * *
* * * * * * * * * *
* * * * * * * * * *
* * * * * * * * * *
* * * * * * * * * *
* * * * * * * * * *
* * * * * * * * * *
* * * * * * * * * *

How many stars are there in the upper line, counted across the page, from left to right?

If you count the stars in the first and second line together, how many will they make?

In three lines, how many stars are there?
In four lines, how many stars are there?
In five lines, how many stars are there?
In six lines, how many stars are there?
In seven lines, how many stars are there?
In eight lines, how many stars are there?
In nine lines, how many stars are there?
In ten lines, how many stars are there?

What numbers are expressed by these figures?

30 50 20 60 40 80 70 90 10 100
32 51 24 63 45 89 77 98 16 99

ADDITION.

Note to Teachers. In all the following exercises, (until we arrive at Miscellaneous Examples, page 43,) the pupils must answer the questions, and recite the sections of the tables appended to the several lessons, with their books closed.

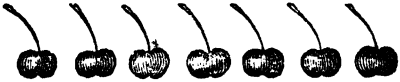
LESSON I.

How many trees are 1 tree and 2 trees ?

Henry's sister gave him 1 apple, and his mother gave him 3 more. How many apples had Henry ? 1 and 3 are how many ?

James found 1 pear under the tree, and John gave him 4 more. How many had James then ? 1 and 4 are how many ?

Sarah's brother gave her 1 cherry, and her mother gave her 7 more. How many had Sarah then ? 1 and 7 are how many ?



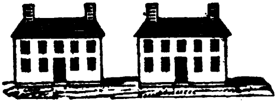
To be committed to memory, and recited verbatim.

1 and 1 are 2
1 and 2 are 3
1 and 3 are 4
1 and 4 are 5
1 and 5 are 6

1 and 6 are 7
1 and 7 are 8
1 and 8 are 9
1 and 9 are 10
1 and 10 are 11

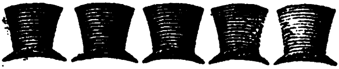
LESSON II.

2 houses are on one side of a street, and 2 on the other side. How many are there on both sides?

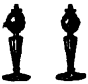
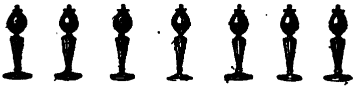


2 chairs are on one side of a room, and 4 on the other side. How many are there on both sides? 2 and 4 are how many?

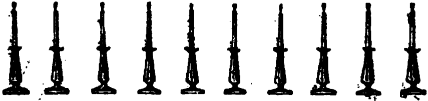
Suppose 2 hats are in one place and 5 in another; how many will there be, if we put them together? 2 and 5 are how many?



There are 2 lamps on one side of a table, and 7 on the other side. How many lamps are there in all? 2 and 7 are how many?

If 2 candles were burning on one table, and 10 on another, how many would there be on both? 2 and 10 are how many?



To be recited.

2 and 1 are 3
2 and 2 are 4
2 and 3 are 5
2 and 4 are 6
2 and 5 are 7

2 and 6 are 8
2 and 7 are 9
2 and 8 are 10
2 and 9 are 11
2 and 10 are 12

LESSON III.

3 birds are on one branch of a grape vine, and 2 on another branch. How many on both branches?

3 and 2 are how many?

3 boys are up to recite, and 3 others are coming to recite with them. How many will there be?

William owns 3 fish-hooks: if he should buy 6 more, how many would he then have?

3 and 6 are how many?

Jane put 3 pins into a cushion, and Lucy put in 9 more. How many were there in the cushion then?

3 and 9 are how many?

Andrew had 3 marbles, and, returning from school, he found 10 more. How many had he then?

3 and 10 are how many?

To be recited.

3 and 1 are 4
3 and 2 are 5
3 and 3 are 6
3 and 4 are 7
3 and 5 are 8

3 and 6 are 9
3 and 7 are 10
3 and 8 are 11
3 and 9 are 12
3 and 10 are 13

Note to Teachers. The numbers embraced in the succeeding questions are represented by unit marks, respectively placed under each question. The learners may be directed, to count these marks, as they have been accustomed to count the pictures.

LESSON IV.

If you had 4 cents in one pocket and 3 in the other, how many cents would you have in both pockets? 4 and 3 are how many?

| | | | | | |

Joseph had 4 marbles, and his brother gave him 4 more. How many marbles had Joseph then?

| | | | | | | |

If you had 4 nuts in your pocket, and I should give you 5 more, how many would you then have? 4 and 5 are how many?

| | | | | | | | |

Sophia put 4 cents into a charity fund, and Augusta put in 7 cents. How many cents did both put in? 4 and 7 are how many?

| | | | | | | | | | |

If you had 4 pins on one sleeve, and 8 on the other, how many pins would you have on both sleeves? 4 and 8 are how many?

| | | | | | | | | | | |

Samuel gave 4 cents for a picture, and 9 cents for a book. How many cents did he give for both of them? 4 and 9 are how many?

| | | | | | | | | | | | |

To be recited.

4 and 1 are 5
4 and 2 are 6
4 and 3 are 7
4 and 4 are 8
4 and 5 are 9

4 and 6 are 10
4 and 7 are 11
4 and 8 are 12
4 and 9 are 13
4 and 10 are 14

LESSON V.

Daniel gave 5 cents for a bow, and 1 cent for an arrow. How many cents did both of them cost?

5 and 1 are how many?

| | | | | |

5 boys are on one end of a form, and 3 on the other end. How many boys are on the whole form?

5 and 3 are how many?

| | | | | | | |

Harriet owned 5 school-books and 5 story-books. How many books did Harriet own in all?

| | | | | | | | | |

Susan has 5 plums, and George has 7. If George give his to Susan, how many will she then have?

5 and 7 are how many?

| | | | | | | | | | | |

5 boys are playing at foot-ball on one side, and 8 on the other side. How many boys on both sides?

5 and 8 are how many?

| | | | | | | | | | | | |

How many cents would it take to buy two picture-books, if one cost 5 cents and the other 9 cents?

5 and 9 are how many?

| | | | | | | | | | | | | |

If an orange cost 5 cents, and a book 10 cents, how many cents will it take to buy both of them?

5 and 10 are how many?

| | | | | | | | | | | | | | |

To be recited.

5 and 1 are 6
5 and 2 are 7
5 and 3 are 8
5 and 4 are 9
5 and 5 are 10

5 and 6 are 11
5 and 7 are 12
5 and 8 are 13
5 and 9 are 14
5 and 10 are 15

LESSON VI.

If I put 6 books down in a pile, and you put on 4 more, how many books will there be in the pile ?

| | | | | | | | | |

6 books and 5 books, would be how many books ?

| | | | | | | | | | |

How many bonnets are 6 bonnets and 6 bonnets ?

| | | | | | | | | | | |

6 hats and 9 hats together, are how many hats ?

| | | | | | | | | | | | | | |

To be recited.

6 and 1 are 7
6 and 2 are 8
6 and 3 are 9
6 and 4 are 10
6 and 5 are 11

6 and 6 are 12
6 and 7 are 13
6 and 8 are 14
6 and 9 are 15
6 and 10 are 16

LESSON VII.

If I pull out 7 quills from a bunch, and then pull out 3 more, how many shall I have taken out ?

| | | | | | | | | |

7 quills and 6 quills together, are how many quills ?

| | | | | | | | | | | | |

How many hats are 7 hats and 7 hats together ?

| | | | | | | | | | | | | |

How many pencils are 7 pencils and 9 pencils ?

| | | | | | | | | | | | | | | |

To be recited.

7 and 1 are 8
7 and 2 are 9
7 and 3 are 10
7 and 4 are 11
7 and 5 are 12

7 and 6 are 13
7 and 7 are 14
7 and 8 are 15
7 and 9 are 16
7 and 10 are 17

LESSON VIII.

Richard has 8 chestnuts and David has only 2. How many will there be, if they put them together?

I I I I I I I I   I I

How many apples are 8 apples and 3 apples?

I I I I I I I I   I I I

How many raisins are 8 raisins and 6 raisins?

I I I I I I I I   I I I I I I

8 pins and 8 pins together, are how many pins?

I I I I I I I I   I I I I I I I I

To be recited.

8 and 1 are 9
8 and 2 are 10
8 and 3 are 11
8 and 4 are 12
8 and 5 are 13

8 and 6 are 14
8 and 7 are 15
8 and 8 are 16
8 and 9 are 17
8 and 10 are 18

LESSON IX.

James has 9 buttons on the front of his jacket, and 2 on the back. How many has he on the jacket?

I I I I I I I I I   I I

How many buttons are 9 buttons and 8 buttons?

I I I I I I I I I   I I I I I I I I

How many cents are 9 cents and 9 cents?

I I I I I I I I I   I I I I I I I I I

How many dollars are 9 dollars and 10 dollars?

I I I I I I I I I   I I I I I I I I I I

To be recited.

9 and 1 are 10
9 and 2 are 11
9 and 3 are 12
9 and 4 are 13
9 and 5 are 14

9 and 6 are 15
9 and 7 are 16
9 and 8 are 17
9 and 9 are 18
9 and 10 are 19

LESSON X.

If I should call 10 boys to the desk, and then should call 4 more, how many boys would be called?

I I I I I I I I I I   I I I I

10 boys and 6 boys, would be how many boys?

I I I I I I I I I I   I I I I I I

How many houses, are 10 houses and 8 houses?

I I I I I I I I I I   I I I I I I I I

How many men, are 10 men and 10 men together?

I I I I I I I I I I   I I I I I I I I I I

To be recited.

10 and 1 are 11
10 and 2 are 12
10 and 3 are 13
10 and 4 are 14
10 and 5 are 15

10 and 6 are 16
10 and 7 are 17
10 and 8 are 18
10 and 9 are 19
10 and 10 are 20

Note to Teachers I have attempted, in the preceding lessons, to present to the eye and mind of learners, a clear view of the union or *addition* of small numbers, in forming larger numbers. It now remains, to fix the sums of the several additions in the memory. For this purpose the teacher may embrace each of the following combinations in two separate questions. For example, (Lesson XI, combination first,) 9 *and* [illegible] *are how many?*—Then, 4 *and* 9 *are how many?*

XI.

9 and 4
6 and 3
8 and 5
2 and 2
10 and 4
7 and 7
4 and 1
9 and 7
5 and 5
10 and 1
9 and 8
4 and 2

XII.

9 and 6
8 and 1
6 and 6
10 and 8
5 and 4
8 and 2
3 and 2
9 and 3
7 and 6
6 and 5
10 and 2
9 and 9

XIII.

8 and 6
5 and 3
10 and 9
8 and 8
6 and 4
9 and 2
10 and 6
3 and 3
7 and 2
4 and 3
7 and 5
10 and 7

XIV.

9 and [illegible]
7 and [illegible]
4 and [illegible]
10 and [illegible]
8 and [illegible]
5 and 2
7 and 4
10 and 5
8 and 7
6 and 2
8 and 3
10 and 10

SUBTRACTION.

Note to Teachers. Children, who have learned addition, may easily be taught subtraction, by leading them to observe the correspondence of the two operations. Questions in addition, (distinguished by italic print,) are therefore connected with the questions in subtraction.

The teacher must here inform the learners, that the *cipher*, (0) represents *nothing* of itself, being used only to occupy a place.

LESSON I.

There was 1 pitcher on the table, but a careless boy knocked it off. What is left on the table?

1, taken from where there was 1, leaves what?

2 trees stood near by, but the wind has blown 1 of them down. What number is left standing?

1, taken from 2, leaves what number?

3 chairs were standing in a row, but a child has thrown 1 of them down. How many are upright?

1 from 3 leaves how many? *How many are* 1 *and* 2?

7 sugar loaves are on a shelf; one of them has the top broken off. How many of them are whole?

1 from 7 leaves how many? *How many are* 1 *and* 6?

To be committed to memory, and recited verbatim.

1 from 1 leaves 0
1 from 2 leaves 1
1 from 3 leaves 2
1 from 4 leaves 3
1 from 5 leaves 4

1 from 6 leaves 5
1 from 7 leaves 6
1 from 8 leaves 7
1 from 9 leaves 8
1 from 10 leaves 9

LESSON II.

There are 3 pitchers, 2 of which have broken handles. What number of them is whole?

2 from 3 leaves what number? *How many are 2 and 1?*

5 boys came up to recite, but 2 of them were sent back, for having no lesson. How many recited?

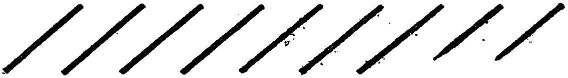
2 from 5 leaves how many? *How many are 2 and 3?*

7 bottles were standing on a table, but 2 of them are turned down. How many are still upright?

2 from 7 leaves how many? *How many are 2 and 5?*

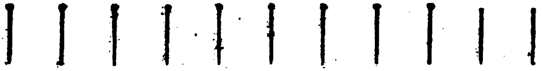
Edward has 9 lead pencils, and he has pointed 2 of them. How many has he, which are not pointed?

2 from 9 leaves how many? *How many are 2 and 7?*



Harriet has 11 pins, but 2 of them have lost their heads. How many have their heads on?

2 from 11 leaves how many? *How many are 2 and 9?*



To be recited.

2 from 2 leaves 0
2 from 3 leaves 1
2 from 4 leaves 2
2 from 5 leaves 3
2 from 6 leaves 4

2 from 7 leaves 5
2 from 8 leaves 6
2 from 9 leaves 7
2 from 10 leaves 8
2 from 11 leaves 9

LESSON III.

In a certain fold there are 5 sheep; 3 of them have lain down to rest. How many are standing?

3 from 5 leaves how many? *How many are 3 and 2?*

6 hens were in a farm yard, and a boy frightened 3 of them away. How many of them remained?

3 from 6 leaves how many? *How many are 3 and 3?*

Robert has 12 quills; 3 of them have the tops cut off, and the others are whole. How many are whole?

3 from 12 leaves how many? *How many are 3 and 9?*

8 cups are on the table, and 3 of them are bottom upward. How many are right side up?

3 from 8 leaves how many? *How many are 3 and 5?*

10 wine glasses are on a waiter, 3 of which are bottom upward. How many are right side up?

3 from 10 leaves how many? *How many are 3 and 7?*

To be recited.

3 from 3 leaves 0
3 from 4 leaves 1
3 from 5 leaves 2
3 from 6 leaves 3
3 from 7 leaves 4

3 from 8 leaves 5
3 from 9 leaves 6
3 from 10 leaves 7
3 from 11 leaves 8
3 from 12 leaves 9

Note to Teachers. The pupils must be informed, that the unit marks, which are inclined, represent the number to be subtracted: and those which are upright, show the number that will be left

LESSON IV.

10 boys were playing ball; 4 of them became tired, and went home. How many were left?

| | | | | | / / / /

Thomas put 8 chestnuts into the embers to roast, and 4 of them were burnt. How many were saved?

4 from 8 leaves how many? *How many are 4 and 4?*

| | | | / / / /

Charles had 12 marbles, but he gave his brother James 4 of them. How many had he left?

4 from 12 leaves how many? *How many are 4 and 8?*

| | | | | | | | / / / /

Mary had 9 apples, and she roasted 4 of them for her sick father. How many had she left?

4 from 9 leaves how many? *How many are 4 and 5?*

| | | | | / / / /

7 bells were ringing last Sabbath; 4 of them ceased before the rest. How many continued ringing?

4 from 7 leaves how many? *How many are 4 and 3?*

| | | / / / /

13 sheep were feeding in a pasture, and 4 of them had lambs. How many of them had no lambs?

4 from 13 leaves how many? *How many are 4 and 9?*

| | | | | | | | | / / / /

To be recited.

4 from 4 leaves 0
4 from 5 leaves 1
4 from 6 leaves 2
4 from 7 leaves 3
4 from 8 leaves 4

4 from 9 leaves 5
4 from 10 leaves 6
4 from 11 leaves 7
4 from 12 leaves 8
4 from 13 leaves 9

LESSON V.

6 scholars may hold up their right hands—now 5 may put them down—how many are still up?

5 from 6 leaves how many? *How many are* 5 *and* 1?

| /////

James had a recess of 10 minutes, and stayed out only 5. How many more might he have stayed?

5 from 10 leaves how many? *How many are* 5 *and* 5?

| | | | | /////

A good farmer had 13 cows, and all but 5 of them were red. How many of them were red?

5 from 13 leaves how many? *How many are* 5 *and* 8?

| | | | | | | | /////

Of 9 men that were in a stage coach, 5 alighted before the end of the route. How many rode on?

5 from 9 leaves how many? *How many are* 5 *and* 4?

| | | | /////

A ship's crew consisted of 14 men, 5 of whom died while at sea. How many arrived safe in port?

5 from 14 leaves how many? *How many are* 5 *and* 9?

| | | | | | | | | /////

Sarah had a party, to which she invited 11 young ladies; only 5 of them came. How many kept away?

5 from 11 leaves how many? *How many are* 5 *and* 6?

| | | | | | /////

A front yard had 8 elms standing in it; 5 of them are cut down. How many are yet standing?

5 from 8 leaves how many? *How many are* 5 *and* 3?

| | | /////

To be recited.

5 from 5 leaves 0	5 from 10 leaves 5
5 from 6 leaves 1	5 from 11 leaves 6
5 from 7 leaves 2	5 from 12 leaves 7
5 from 8 leaves 3	5 from 13 leaves 8
5 from 9 leaves 4	5 from 14 leaves 9

LESSON VI.

9 doves were picking oats before the door, and a dog drove off 6 of them. How many remained?

| | | / / / / / /

6 cents taken from 8 cents, leave how many?

| | / / / / / /

Ann had 14 pins, and lost 6. How many were left?

| | | | | | | | / / / / / /

Take 6 books from 12 books—how many remain

| | | | | | / / / / / /

To be recited.

6 from 6 leaves 0
6 from 7 leaves 1
6 from 8 leaves 2
6 from 9 leaves 3
6 from 10 leaves 4

6 from 11 leaves 5
6 from 12 leaves 6
6 from 13 leaves 7
6 from 14 leaves 8
6 from 15 leaves 9

LESSON VII.

Henry's pear tree had 15 blossoms on it; 7 of them dropped off; the rest ripened. How many ripened?

| | | | | | | | / / / / / / /

7 cents taken from 11 cents, leave how many?

| | | | / / / / / / /

7 cents taken from 16 cents, leave how many?

| | | | | | | | | / / / / / / /

Take 7 books from 12 books—how many remain?

| | | | | / / / / / / /

To be recited.

7 from 7 leaves 0
7 from 8 leaves 1
7 from 9 leaves 2
7 from 10 leaves 3
7 from 11 leaves 4

7 from 12 leaves 5
7 from 13 leaves 6
7 from 14 leaves 7
7 from 15 leaves 8
7 from 16 leaves 9

LESSON VIII.

There are 14 lessons in subtraction ; you have now studied 8 of them. How many remain to be studied ?

| | | | | | / / / / / / / /

8 hats taken from 12 hats, leave how many hats ?

| | | | / / / / / / / /

Take 8 pins from 16 pins——how many remain ?

| | | | | | | | / / / / / / / /

8 pins taken from 15 pins, leave how many pins ?

| | | | | | | / / / / / / / /

To be recited.

8 from 8 leaves 0	8 from 13 leaves 5
8 from 9 leaves 1	8 from 14 leaves 6
8 from 10 leaves 2	8 from 15 leaves 7
8 from 11 leaves 3	8 from 16 leaves 8
8 from 12 leaves 4	8 from 17 leaves 9

LESSON IX.

Stephen purchased 16 quills, to use in writing after using 9 of them, how many had he left ?

| | | | | | | / / / / / / / / /

9 quills taken from 13 quills leave how many ?

| | | | / / / / / / / / /

Take 9 nuts from 17 nuts——how many remain ?

| | | | | | | | / / / / / / / / /

John had 18 quills and lost 9 how many remain

| | | | | | | | | / / / / / / / / /

To be recited.

9 from 9 leaves 0	9 from 14 leaves 5
9 from 10 leaves 1	9 from 15 leaves 6
9 from 11 leaves 2	9 from 16 leaves 7
9 from 12 leaves 3	9 from 17 leaves 8
9 from 13 leaves 4	9 from 18 leaves 9

LESSON X.

Eliza has 14 books in her library, and she has read through 10 of them. How many has she yet to read?

| | | | / / / / / / / / / /

Take 10 books from 17 books—how many remain?

| | | | | | | / / / / / / / / / /

Take 10 cents from 16 cents—how many remain?

| | | | | | / / / / / / / / / /

Take 10 cents from 18 cents—how many remain?

| | | | | | | | / / / / / / / / / /

To be recited.

10 from 10 leaves 0
10 from 11 leaves 1
10 from 12 leaves 2
10 from 13 leaves 3
10 from 14 leaves 4

10 from 15 leaves 5
10 from 16 leaves 6
10 from 17 leaves 7
10 from 18 leaves 8
10 from 19 leaves 9

Note to Teachers. The following connexions of numbers may be embraced in questions by the teacher; thus,—3 from 4 leaves how many?

XI.

3 from 4
5 from 14
8 from 8
10 from 19
7 from 8
2 from 11
9 from 18
4 from 13
2 from 3
9 from 11
4 from 8
3 from 12
4 from 9
3 from 10
5 from 12
7 from 9

XII.

8 from 17
9 from 15
5 from 8
7 from 16
6 from 11
2 from 8
10 from 14
8 from 13
6 from 9
1 from 10
9 from 13
2 from 6
5 from 10
8 from 14
7 from 12
1 from 3

XIII.

10 from 12
8 from 10
3 from 7
6 from 14
2 from 9
7 from 13
9 from 17
4 from 6
7 from 14
3 from 11
4 from 12
2 from 5
4 from 11
9 from 16
3 from 9
6 from 12

XIV.

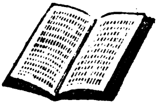
5 from 7
8 from 11
6 from 10
7 from 15
5 from 9
9 from 12
6 from 13
7 from 11
10 from 16
4 from 12
3 from 6
5 from 13
8 from 16
3 from 8
6 from 15
9 from 14

MULTIPLICATION.

LESSON I.

On Monday morning, Andrew's father told him, that he would give him one new book for every time he recited correctly, during the week. On Saturday it appeared, that he had recited correctly only *once*. What number of books did he receive?

Once 1 is what number?

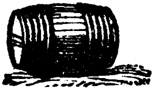


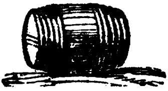
Charles caught 1 fish, every time he went out to angle. How many did he catch, in going 2 times?

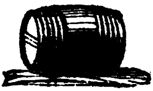
2 times 1 are how many?

A young cooper worked three days, and made 1 barrel each day. How many barrels did he make?

3 times 1 are how many?







Stephen lost 1 ball, every time he went upon the common. How many did he lose in going 4 times?

4 times 1 are how many?

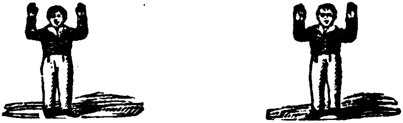
To be committed to memory, and recited verbatim.

Once 1 is 1
2 times 1 are 2
3 times 1 are 3
4 times 1 are 4
5 times 1 are 5

6 times 1 are 6
7 times 1 are 7
8 times 1 are 8
9 times 1 are 9
10 times 1 are 10

LESSON II.

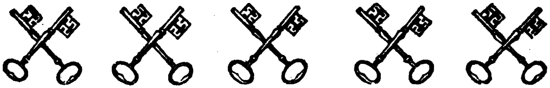
A boy has 2 hands : how many hands have 2 boys?
2 times 2 are how many ?



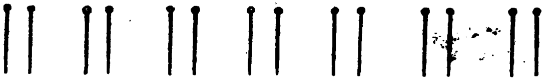
A rabbit has 2 ears: how many ears have 3 rabbits?
3 times 2 are how many ?

James caught 2 fishes, every time he went fishing. How many did he catch, in going 4 times ?
4 times 2 are how many ?

A clerk lost 2 keys, every time he went to the theatre. How many did he lose, in going 5 times?
5 times 2 are how many ?



Harriet lost 2 pins every time she went to school. How many did she lose, in going 7 times ?
7 times 2 are how many ?



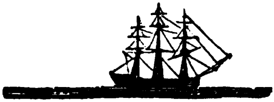
To be recited.

Once 2 is 2
2 times 2 are 4
3 times 2 are 6
4 times 2 are 8
5 times 2 are 10

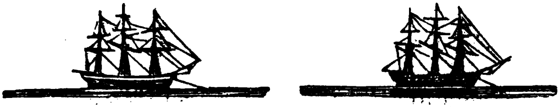
6 times 2 are 12
7 times 2 are 14
8 times 2 are 16
9 times 2 are 18
10 times 2 are 20

LESSON III.

When the sails of a ship are furled, her masts are distinctly seen. How many masts has 1 ship ?
Once 3 is how many ?



Since 1 ship has 3 masts, how many have 2 ships ?
2 times 3 are how many ?



Richard was learning to write, and he used 3 quills every week. How many did he use in 3 weeks?
3 times 3 are how many ?

If 1 fork have 3 points, how many have 4 forks ?
4 times 3 are how many ?

We generally find 3 clover leaves, growing upon one stem. How many leaves grow upon 5 stems ?
5 times 3 are how many ?

To be recited

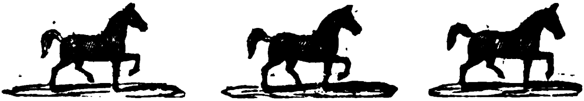
Once 3 is 3
2 times 3 are 6
3 times 3 are 9
4 times 3 are 12
5 times 3 are 15

6 times 3 are 18
7 times 3 are 21
8 times 3 are 24
9 times 3 are 27
10 times 3 are 30

LESSON IV.

3 horses are trotting off without riders. Each horse has 4 feet: how many feet have they all?

3 times 4 are how many?



2 boys went a fishing, and each of them caught 4 trouts. How many trouts did they both catch?

2 times 4 are how many?

|||| ||||

A lady, who had 4 daughters, gave each of them 4 books. How many did she give them all?

4 times 4 are how many?

|||| |||| |||| ||||

6 chairs are standing in a row, and each chair has 4 legs. How many legs have all the chairs?

6 times 4 are how many?

|||| |||| |||| |||| |||| ||||

Lucy has 5 picture books, which cost 4 cents apiece. How many cents did they all cost?

5 times 4 are how many?

|||| |||| |||| |||| ||||

Susan gets 4 merit-marks, every time she recites. How many does she get, in reciting 7 times?

7 times 4 are how many?

*4 4 4 4 4 4 4

To be recited.

Once 4 is 4
2 times 4 are 8
3 times 4 are 12
4 times 4 are 16
5 times 4 are 20

6 times 4 are 24
7 times 4 are 28
8 times 4 are 32
9 times 4 are 36
10 times 4 are 40

---

*The learners may be instructed to select any four marks above, and count them as many times as there are *fours* in the line of figures.

LESSON V.

4 houses are situated so that each house presents 5 windows. How many do they all present?

4 times 5 are how many?

A ship-master gave to 2 little boys, 5 oranges apiece. How many oranges did he give to both?

2 times 5 are how many?

||||| |||||

Mary reads 5 pages of history every morning. How many pages does she read in 3 mornings?

3 times 5 are how many?

||||| ||||| |||||

If I pay 5 cents for riding over the bridge once, how many must I pay for riding over 5 times?

5 times 5 are how many?

||||| ||||| ||||| ||||| |||||

If a pupil get 5 merit-tickets for every week of perfect lessons, how many can he get in 6 weeks?

6 times 5 are how many?

5 5 5 5 5 5

Stephen performs 5 lessons every day. How many lessons does he perform in 8 days?

8 times 5 are how many?

5 5 5 5 5 5 5 5

To be recited.

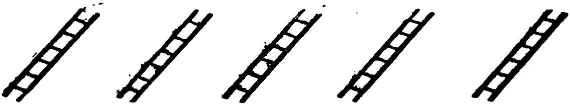
Once 5 is 5
2 times 5 are 10
3 times 5 are 15
4 times 5 are 20
5 times 5 are 25

6 times 5 are 30
7 times 5 are 35
8 times 5 are 40
9 times 5 are 45
10 times 5 are 50

LESSON VI.

If there be 6 rounds in one ladder, how many rounds are there in 5 ladders of the same length?

5 times 6 are how many?



If a hymn consist of 3 stanzas, and each stanza of 6 lines, how many lines are there in the hymn?

3 times 6 are how many?

|||||| |||||| ||||||

4 men went out in a hunting party, and each man had 6 hounds. How many had they all?

4 times 6 are how many?

|||||| |||||| |||||| ||||||

If a carpenter put 6 panels into one door, how many panels does he put into 6 doors?

6 times 6 are how many?

6 6 6 6 6 6

I have only 6 sheep, and my neighbour has 8 times as many. How many has my neighbour?

8 times 6 are how many?

6 6 6 6 6 6 6 6

James has 7 books, and every book has 6 pictures in it. How many pictures are there in all?

7 times 6 are how many?

6 6 6 6 6 6 6

To be recited.

Once 6 is 6	6 times 6 are 36
2 times 6 are 12	7 times 6 are 42
3 times 6 are 18	8 times 6 are 48
4 times 6 are 24	9 times 6 are 54
5 times 6 are 30	10 times 6 are 60

LESSON VII

If 1 nair-comb have 7 teeth in it, how many teeth have 3 hair-combs of the same size?

3 times 7 are how many?

If 4 boys stand up to read, and each boy read 7 lines, how many lines will they all read?

4 times 7 are how many?

IIIIIII IIIIIII IIIIIII IIIIIII

If you had 7 marbles in each of your 2 hands, how many marbles would you have in all?

2 times 7 are how many?

IIIIIII IIIIIII

If I give you some raisins 7 times, giving you 7 raisins each time, how many will you have?

7 times 7 are how many?

7 7 7 7 7 7 7

If you should buy 6 oranges, and pay 7 cents apiece for them, what would the whole cost?

6 times 7 are how many?

7 7 7 7 7 7

If I pay 7 cents for one lead pencil, how many cents must I have, to pay for 8 lead pencils?

8 times 7 are how many?

7 7 7 7 7 7 7 7

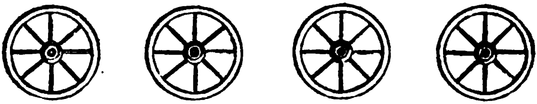
To be recited.

Once	7	is	7	6 times	7	are	42
2 times	7	are	14	7 times	7	are	49
3 times	7	are	21	8 times	7	are	56
4 times	7	are	28	9 times	7	are	63
5 times	7	are	35	10 times	7	are	70

LESSON VIII.

4 wheels are on an engine, and each wheel has 8 spokes. How many spokes in all the wheels?

4 times 8 are how many?



2 wagons went to market, carrying 8 barrels of cider apiece. How many did they both carry?

2 times 8 are how many?

IIIIIIII IIIIIIII

If there be 8 leaves in one writing-book, how many leaves will there be in 3 writing-books?

3 times 8 are how many?

IIIIIIII IIIIIIII IIIIIIII

A fishing party went out in 7 boats, and each boat carried 8 persons. How many went in the party?

7 times 8 are how many?

8 8 8 8 8 8 8

If 8 cents be paid for one writing-book, how many cents must be paid for 6 writing-books?

6 times 8 are how many?

8 8 8 8 8 8

Henry was 8 weeks in this book, but Harry Sloth was 5 times as long. How long was Harry?

5 times 8 are how many?

8 8 8 8 8

To be recited.

Once 8 is 8
2 times 8 are 16
3 times 8 are 24
4 times 8 are 32
5 times 8 are 40

6 times 8 are 48
7 times 8 are 56
8 times 8 are 64
9 times 8 are 72
10 times 8 are 80

LESSON IX.

Edward has 2 jackets, and on each jacket there are 9 buttons. How many buttons are on both ?

IIIIIIIII IIIIIIIII

How many quills have 3 boys; each boy having 9 ?

IIIIIIIII IIIIIIIII IIIIIIIII

If one book cost 9 cents, what will 6 books cost ?

9 9 9 9 9 9

If one book cost 9 cents, what will 8 books cost ?

9 9 9 9 9 9 9 9

To be recited.

Once 9 is 9
2 times 9 are 18
3 times 9 are 27
4 times 9 are 36
5 times 9 are 45

6 times 9 are 54
7 times 9 are 63
8 times 9 are 72
9 times 9 are 81
10 times 9 are 90

LESSON X.

If you take 10 steps in crossing the room once, how many would you take in crossing 3 times ?

IIIIIIIIII IIIIIIIIII IIIIIIIIII

How many teeth in 6 rakes ; each rake having 10?

10 10 10 10 10 10

What cost 8 books, at 10 cents for each book ?

10 10 10 10 10 10 10 10

What cost 7 books, at 10 cents for each book ?

10 10 10 10 10 10 10

To be recited.

Once 10 is 10
2 times 10 are 20
3 times 10 are 30
4 times 10 are 40
5 times 10 are 50

6 times 10 are 60
7 times 10 are 70
8 times 10 are 80
9 times 10 are 90
10 times 10 are 100

LESSON XI.

Joseph made a number of stars upon his slate, arranging them in such order, that they appeared in rows two ways. Viewing them one way, there were 3 rows of 10 stars each—thus, there were 3 times 10 stars. Viewing them the other way, there were 10 rows of 3 stars each—thus, there were 10 times 3 stars. How many stars did he make?

✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱
✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱
✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱ ✱

John and Ezra compared their marbles as follows. John placed his, 5 in a row, and had enough to make 4 rows. Ezra placed his, 4 in a row, and had enough to make 5 rows. How many had each boy?

● ● ● ● ● ● ● ● ●
● ● ● ● ● ● ● ● ●
● ● ● ● ● ● ● ● ●
● ● ● ● ● ● ● ● ●
● ● ● ●

Note to Teachers. Embrace the following combinations in questions, thus,—3 times 6 are how many?—6 times 3 are how many?

Embraced in Lesson XI.

3 times 6
5 times 8
2 times 2
4 times 10
7 times 7
1 time 4
7 times 9
5 times 5
1 time 10
8 times 9
2 times 4

XII.

1 time 8
6 times 6
8 times 10
4 times 5
2 times 8
2 times 3
3 times 9
6 times 7
5 times 6
2 times 10
9 times 9

XIII.

3 times 5
9 times 10
8 times 8
4 times 6
2 times 9
6 times 10
3 times 3
2 times 7
3 times 4
5 times 7
7 times 10

XIV.

3 times 7
4 times 4
3 times 10
4 times 8
2 times 5
4 times 7
5 times 10
7 times 8
2 times 6
3 times 8
10 times 10

DIVISION.

Note to Teachers. The correspondence of Division and Multiplication, if not discovered by the pupils, should be pointed out to them.

LESSON I.

When Alfred was sick one of his school-mates brought him 8 grapes; but his physician said, he must eat only one at a time. How many times could he have 1 grape, before they would all be gone?

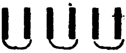
How many times 1 are there in 8?

If I pay 1 cent for every time I walk over the bridge, how many times can I go over for 4 cents?

How many times 1 are there in 4?

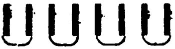
A certain farmer has 6 oxen, and it takes 2 of them to make one pair. How many pairs of oxen has he?

How many *twos* are there in 6?



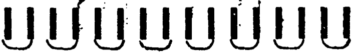
John can carry 2 sticks of wood at once; and he has 8 sticks to carry off. How many times must he go?

How many times 2 are there in 8?



My purse contains 16 cents. Large quills are 2 cents apiece; so I can buy one quill for every 2 cents in the purse. How many can I buy?

How many times 2 are there in 16?



To be committed to memory, and recited verbatim.

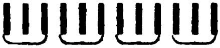
2 in 2, once
2 in 4, 2 times
2 in 6, 3 times
2 in 8, 4 times
2 in 10, 5 times

2 in 12, 6 times
2 in 14, 7 times
2 in 16, 8 times
2 in 18, 9 times
2 in 20, 10 times

LESSON II.

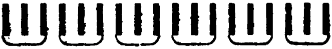
If 12 cents were upon the desk, and I should begin taking them off, three at a time, how many times might I take off 3, before they would all be off?

How many *threes* are there in 12?



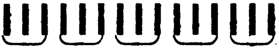
David had 18 sticks of wood to carry up stairs, and he could carry only 3 at a time. How many times had he to go, in order to carry up the whole?

How many times 3 are there in 18?



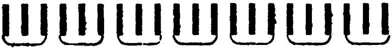
A sportsman shot 3 plovers every time he fired. How many times must he fire, to shoot 15 plovers?

How many times 3 in 15? *How many are 5 times 3?*



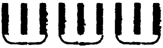
Jane gets 3 merit-marks for every perfect lesson. How many lessons must she recite, to get 21 marks?

How many times 3 in 21? *How many are 7 times 3?*



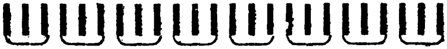
If 3 books be required to supply one scholar, how many scholars may be supplied from 9 books?

How many times 3 in 9? *How many are 3 times 3?*



Francis has 24 cents, with which he is going to buy oranges, at 3 cents apiece. How many can he buy?

How many times 3 in 24? *How many are 8 times 3?*



To be recited.

3 in 3, once
3 in 6, 2 times
3 in 9, 3 times
3 in 12, 4 times
3 in 15, 5 times
3 in 18, 6 times
3 in 21, 7 times
3 in 24, 8 times
3 in 27, 9 times
3 in 30, 10 times

LESSON III.

If 4 horses be required to draw one stage-coach, how many stage-coaches might 12 horses draw?

$$\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}$$

How many times 4 pages, in a book of 24 pages?

$$\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}$$

How many times 4 pages, in a book of 16 pages?

$$\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}$$

How many times 4 pages, in a book of 20 pages?

$$\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}\,\underbrace{||||}$$

To be recited.

4 in 4, once	4 in 24, 6 times
4 in 8, 2 times	4 in 28, 7 times
4 in 12, 3 times	4 in 32, 8 times
4 in 16, 4 times	4 in 36, 9 times
4 in 20, 5 times	4 in 40, 10 times

LESSON IV.

If you write 5 lines in a writing-book, every day, how many days would it take to write 20 lines?

$$\underbrace{|||||}\,\underbrace{|||||}\,\underbrace{|||||}\,\underbrace{|||||}$$

In a row of 10 seats, how many times 5 seats?

$$\underbrace{|||||}\,\underbrace{|||||}$$

In a row of 15 seats, how many times 5 seats?

$$\underbrace{|||||}\,\underbrace{|||||}\,\underbrace{|||||}$$

In a row of 25 seats, how many times 5 seats?

$$\underbrace{|||||}\,\underbrace{|||||}\,\underbrace{|||||}\,\underbrace{|||||}\,\underbrace{|||||}$$

To be recited.

5 in 5, once	5 in 30, 6 times
5 in 10, 2 times	5 in 35, 7 times
5 in 15, 3 times	5 in 40, 8 times
5 in 20, 4 times	5 in 45, 9 times
5 in 25, 5 times	5 in 50. 10 times

LESSON V.

18 boys were in a rank, and were asked, how many times 6 boys there were? You may tell.

$$\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}$$

In a rank of 12 boys, how many times 6 boys?

$$\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}$$

In a rank of 30 boys, how many times 6 boys?

$$\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}$$

In a rank of 24 boys, how many times 6 boys?

$$\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|}$$

To be recited.

6 in 6, once
6 in 12, 2 times
6 in 18, 3 times
6 in 24, 4 times
6 in 30, 5 times

6 in 36, 6 times
6 in 42, 7 times
6 in 48, 8 times
6 in 54, 9 times
6 in 60, 10 times

LESSON VI.

The first class, in a certain school, consists of 28 girls. How many times 7 girls are in the class?

$$\underbrace{|\,|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|\,|}$$

How many times 7 girls, in a class of 21 girls?

$$\underbrace{|\,|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|\,|}\underbrace{|\,|\,|\,|\,|\,|\,|}$$

How many times 7 girls, in a class of 42 girls?

7 7 7 7 7 7

How many times 7 girls, in a class of 56 girls?

7 7 7 7 7 7 7 7

To be recited.

7 in 7, once
7 in 14, 2 times
7 in 21, 3 times
7 in 28, 4 times
7 in 35, 5 times

7 in 42, 6 times
7 in 49, 7 times
7 in 56, 8 times
7 in 63, 9 times
7 in 70, 10 times

LESSON VII.

Emeline's picture-book consists of 32 leaves. How many times 8 leaves are contained in the book?

$$\underbrace{\text{I I I I I I I I}}\underbrace{\text{I I I I I I I I}}\underbrace{\text{I I I I I I I I}}\underbrace{\text{I I I I I I I I}}$$

In a book of 24 leaves, how many times 8 leaves?

$$\underbrace{\text{I I I I I I I I}}\underbrace{\text{I I I I I I I I}}\underbrace{\text{I I I I I I I I}}$$

In a book of 48 leaves, how many times 8 leaves?

8 8 8 8 8 8

In a book of 64 leaves, how many times 8 leaves?

8 8 8 8 8 8 8 8

To be recited.

8 in 8, once
8 in 16, 2 times
8 in 24, 3 times
8 in 32, 4 times
8 in 40, 5 times
8 in 48, 6 times
8 in 56, 7 times
8 in 64, 8 times
8 in 72, 9 times
8 in 80, 10 times

LESSON VIII.

There is a school of 27 boys, and 9 boys are in each of the classes. How many classes are there?

$$\underbrace{\text{I I I I I I I I I}}\underbrace{\text{I I I I I I I I I}}\underbrace{\text{I I I I I I I I I}}$$

In a school of 45 boys, how many times 9 boys?

9 9 9 9 9

In a school of 63 boys, how many times 9 boys?

9 9 9 9 9 9 9

In a school of 81 boys, how many times 9 boys?

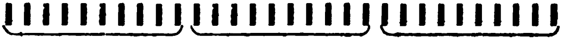
9 9 9 9 9 9 9 9 9

To be recited.

9 in 9, once
9 in 18, 2 times
9 in 27, 3 times
9 in 36, 4 times
9 in 45, 5 times
9 in 54, 6 times
9 in 63, 7 times
9 in 72, 8 times
9 in 81, 9 times
9 in 90, 10 times

LESSON IX

A farmer, who keeps a flock of 30 sheep, has a separate fold for every 10. How many folds has he ?



How many times 10 sheep, in a flock of 50 sheep ?

10 10 10 10 10

How many times 10 sheep, in a flock of 40 sheep ?

10 10 10 10

How many times 10 sheep, in a flock of 70 sheep ?

10 10 10 10 10 10 10

To be recited.

10 in 10, once
10 in 20, 2 times
10 in 30, 3 times
10 in 40, 4 times
10 in 50, 5 times
10 in 60, 6 times
10 in 70, 7 times
10 in 80, 8 times
10 in 90, 9 times
10 in 100, 10 times

Note to Teachers. The following numbers may be embraced in separate questions, thus—How many times 4 are there in 36 ?

X.

4 in 36
3 in 18
5 in 40
2 in 4
4 in 40
7 in 49
1 in 4
7 in 63
5 in 25
1 in 10
8 in 72
2 in 8
6 in 54
1 in 8
6 in 36
8 in 80
4 in 20

XI.

2 in 16
2 in 6
3 in 27
6 in 42
5 in 30
2 in 20
9 in 81
6 in 48
3 in 15
9 in 90
8 in 64
4 in 24
2 in 18
6 in 60
3 in 9
2 in 14
3 in 12

XII.

5 in 35
7 in 70
5 in 45
3 in 21
4 in 16
3 in 30
4 in 32
2 in 10
4 in 28
5 in 50
7 in 56
2 in 18
3 in 24
10 in 70
9 in 36
6 in 18
9 in 63

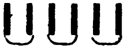
XIII.

9 in 72
9 in 54
10 in 80
9 in 27
7 in 42
8 in 48
9 in 18
10 in 60
7 in 14
7 in 35
9 in 45
7 in 21
8 in 32
7 in 28
10 in 50
8 in 56
10 in 100

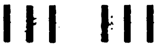
Note to Teachers It will be perceived, that, in the preceding examples, Division has been viewed in only one of its purposes—that of investigating the number of times a small number is contained in a larger. We have now to pursue the same process, for the purpose of dividing the larger number into as many equal parts, as there are units in the smaller number, and discovering the magnitude of one of the parts.

LESSON XIV.

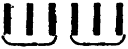
James and Henry had six raisins, to divide between them. They said, 'We are 2 boys, and there are 6 raisins. Now if each of us take up *one* raisin, then *two* raisins will be taken up ; therefore, we can each of us take up as many raisins, as there are *twos* in the six.' How many could each boy take up ?



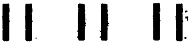
When a number is divided into 2 equal parts, one of the parts is called, *one half* of the number. What is one half of 6 ?



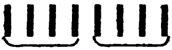
Three boys, George, John and Thomas, found 6 marbles, and wished to share them equally. George said to the others, 'Here are 3 boys of us : let us find how many times 3 marbles there are, and then we can each of us take 1 marble from every 3 marbles.' How many marbles did each boy get ?



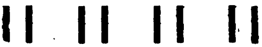
When a number is divided into 3 equal parts, one of the parts is called, *one third* of the number. What is one third of 6 ?



4 little girls, who own eight books together, wish to divide their books, and take their shares. As many times as 4 is contained in 8, so many books must each girl have. How many must each girl have ?



When a number is divided into 4 equal parts, one of the parts is called, *one fourth* of the number. What is one fourth of 8 ?



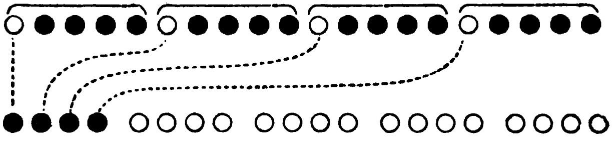
Note to Teachers. The learners may be referred, if necessary, to the preambles of the second, fourth and sixth questions in the next preceding lesson, for answers to the first three questions in this lesson.

LESSON XV.

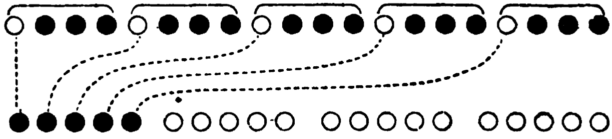
What do we mean by *one half* of a number?
What do we mean by *one third* of a number?
What do we mean by *one fourth* of a number?

What is one half of 2 cents? One third of 3 cents? One fourth of 4? One fifth of 5? One sixth of 6? One seventh of 7? One eighth of 8? One ninth of 9? One tenth of 10?

5 boys had 20 marbles to share between them, and the oldest boy performed the division. He said, 'One boy must have one fifth of the marbles. One fifth of 5 is 1, and one fifth of 20 is as many times 1, as there are *fives* in 20.' To prove what he said, he placed the marbles in a row, and, after rolling out 1 from every 5 for himself, requested the other boys to roll out theirs. How many did each boy take?



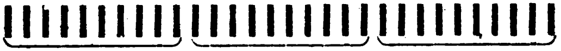
If 4 boys, who own 20 marbles together, take their separate shares, how many does each boy take?



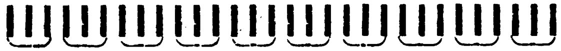
We have 18 books, to be placed in 6 equal piles. We first find how many times 6 books there are, and then take 1 book from every 6, to make a pile. How many books will there be in each pile?

LESSON XVI.

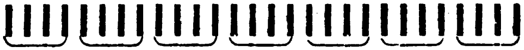
I have 30 quills for 10 boys ; each boy must have one tenth of them. How many must I give to 1 boy ?



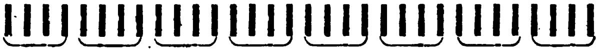
30 roses were given to 3 girls ; each girl received one third of them. How many did 1 girl receive ?



If 28 cents be required for 4 story books, how many cents would 1 book cost, at the same rate ?



32 chestnuts were roasting, which 4 boys owned in equal shares. How many belong to each boy ?



5 *is contained in* 20, *how many times ?* Then one fifth of 20 is what ? One fourth of 20 is what ?

10 *is contained in* 30, *how many times ?* Then one tenth of 30 is what ? One third of 30 is what ?

6 *is contained in* 24, *how many times ?* Then one sixth of 24 is what ? One fourth of 24 is what ?

3 *is contained in* 6, *how many times ?* Then one third of 6 is what ? One half of 6 is what ?

8 *is contained in* 16, *how many times ?* Then one eighth of 16 is what ? One half of 16 is what ?

4 *is contained in* 12, *how many times ?* Then one fourth of 12 is what ? One third of 12 is what ?

10 *is contained in* 90, *how many times ?* Then one tenth of 90 is what ? One ninth of 90 is what ?

5 *is contained in* 15, *how many times ?* Then one fifth of 15 is what ? One third of 15 is what ?

MISCELLANEOUS EXAMPLES.

Note to Teachers. Scholars will be found able, at this period of the course, to perform all the simple operations, which do not imply the combination of numbers higher than 10. Further practice, however, will be requisite, to enable them to determine the operations proper to be adopted in promiscuous questions.

The books may be open during the recitation of all the succeeding lessons, and the questions may be read either by the scholars or the teacher. The scholars should perform the operations audibly, and give their own reasons for the process they adopt. It is essential, that the pupils' own apprehensions should direct them, in the process of solution. Therefore, they should not be compelled, nor even allowed to use any form of expression, which they have not made their own. Their first attempts at reasoning, however puerile, should not be rejected—they should be received with complacency, and corrected in a manner, not likely to destroy their reliance upon their own understanding.

LESSON I.

1. Ann has 4 sisters older than herself, and 3 younger than herself. How many sisters has she?

Solution. The number of sisters older, and the number of sisters younger than herself, must be added together. 4 and 3 are 7, which is the answer.

2. Alfred learned the answers of 13 questions, but he forgot 3 of them. How many did he remember?

Solution. We take the number of answers which he forgot, from the number he learned, and the number left is the answer. 3 from 13 leaves 10.

3. There were 17 apples in a basket; only 8 of them were sound. How many were defective?

4. A hat-maker displayed 10 hats in one window, and 6 in another. How many were there in both?

5. If 5 plates lie on one side of a table, and 4 on the other, how many will there be on both sides?

6. At the window, I saw 8 ladies pass up street, and 4 down street. How many passed both ways?

7. A boy, who had 12 buttons upon his jacket, lost off 5 of them. How many were left on?

8. While a flock of 15 wild geese were flying over, 6 of them were shot. How many escaped?

LESSON II.

1. If 8 girls recite, and each of them answer 4 questions, how many will they all answer?

Solution. 8 girls will answer 8 times as many questions as one girl. 8 times 4 questions are 32 questions.

2. How many roses would there be on 5 rose bushes, if each of the bushes bore 5 roses?

3. There are 13 windows in a house. How many of them are open, while only 6 of them are shut?

4. If a house have 6 windows open, and 7 windows shut, how many windows has the house?

5. How many squares of glass are there in a window, that has 4 squares in length, and 3 in width?

6. If 10 barrels of cider can be carried in one wagon, how many can be carried in 4 wagons?

7. A wagoner sold 10 barrels of cider, at 3 dollars a barrel. How many dollars did he receive?

LESSON III.

1. It takes 4 boys to play a game at ball. How many games can 24 boys play, at the same time?

Solution. 24 boys can play as many games as there are *fours* in 24. 4 is contained in 24, 6 times.

2. How many oranges can you purchase for 27 cents, when they are sold at 3 cents apiece?

3. If oranges can be purchased for 3 cents apiece, how many cents will 9 oranges cost?

4. A boy, who had 11 cents, paid 9 cents for a football. How many cents had he left?

5. The sun rises every day, and there are 7 days in a week. How many times does it rise in 7 weeks?

6. William was sick, and was confined to the house 49 days. How many weeks was he sick?

7. There are 7 questions in this lesson, and 7 in the next preceding lesson. How many in both?

LESSON IV.

1. One of 5 brothers, who owned 30 doves in company, sold his share. How many did he sell?

   Solution. 1 boy is one fifth of 5 boys, and he sold one fifth of 30 doves. One fifth of 30 is 6.

2. A farmer, who raised 48 lambs, found, that 1 of every 6 was black. How many were black?

3. In fishing, this morning, I caught 13 fishes; but 7 of them escaped. How many had I remaining?

4. There were 5 pears upon each of 3 young pear trees. How many pears were there in all?

5. There are 8 rose bushes on one side of a garden path, and 8 on the other. How many on both?

6. If it take 8 squares of glass for a window, how many squares are required for 8 windows?

7. A boy gave 40 kernels of corn to 5 ducks How many kernels were there for each duck?

LESSON V.

1. Martha is 10 years old, and Maria is 7 years old. What is the difference in their ages?

   Solution. We take 7 years from 10 years, and the number left is the difference. 7 from 10 leaves 3.

2. A certain farmer has 20 sheep and 10 lambs. How many more sheep than lambs has he?

3. A boat crossed the ferry with 6 horses, and returned with 5. How many both ways?

4. If a baker use 18 barrels of flour in 9 weeks, how many barrels does he use in one week?

5. How many weeks will 21 barrels of flour last a baker, who uses 3 barrels every week?

6. There are 9 lines ruled upon one page of my writing-book. How many are there on 5 pages?

7. If you have 17 cents, and pay 7 of them for a writing-book, how many will you have left?

LESSON VI.

1. If you wished to divide 54 nuts equally among 6 boys, how many would you give to each boy ?

2. What is one sixth of 6? of 54 ? of 60 ?

3. One day, there were 7 girls at school, and 5 times as many boys. How many boys were there ?

4. How many are 5 times 7 ? 5 times 5 ? 6 ?

5. How many oranges can be purchased for 25 cents, when they are sold at 5 cents apiece ?

6. How many times 5 in 25 ? in 50 ? in 35 ?

7. Richard gave 9 cents for a kite, and 8 cents for a line. How much did he give for both ?

8. How many are 9 and 8 ? 9 and 1 ? 9 and 4 ?

9. George answered 11 questions, and Stephen 6 How many more did George answer, than Stephen ?

10. 11 are how many more than 6 ? than 9 ? 7 ?

11. If 4 boys pay 40 cents for breaking a square of glass, how many cents does each boy pay ?

12. What is one fourth of 4 ? of 40 ? of 20 ?

LESSON VII.

1. Of the 9 pictures which hung in my room, I have taken down 3. How many remain hanging ?

2. 3 from 9 leaves how many ? 3 from 8 ?

3. I have 8 cows, but my farm will feed twice as many. How many will my farm keep ?

4. How many are twice 8 ? twice 6 ? twice 9 ?

5. If you had 7 pins in one sleeve, and 5 in the other, how many would you have in both ?

6. How many are 7 and 5 ? 7 and 3 ? 7 and 9 ?

7. A landlord, who had 10 rooms, received 20 men to lodge. How many might he put in a room ?

8. What is one tenth of 20 ? of 40 ? of 60 ?

9. If 6 boys put 6 books apiece upon the table, how many books will there be on the table ?

10. How many are 6 times 6 ? 6 times 8 ? 9 ?

11. James found a cluster of 14 grapes. After giving me 7 of them, how many had he left ?

12. 7 from 14 leaves how many ? 7 from 8 ?

LESSON VIII.

1. At 9 o'clock, John was asked, what o'clock it would be 3 hours after that time. You may answer.

2. How many are 9 and 3? 9 and 6? 9 and 4?

3. Suppose a goldsmith can make 7 finger rings in one day, how many can he make in 6 days?

4 How many are 6 times 7? 6 times 8? 10?

5. James has 6 story books, and Sarah has 6 picture books. Who has the greater number of books?

6 6 from 6 leaves how many? 6 from 11?

7. 24 persons rode to the city in 3 coaches. How many were there to ride in each coach?

8. What is one third of 24? of 15? of 12?

9. If 8 persons can ride in one coach, how many coaches are required to carry 24 persons?

10. How many times 8 in 24? in 72? in 80?

11. A coachman has 4 coaches, and for every coach, has 4 horses. How many horses has he?

12. How many are 4 times 4? 4 times 6? 9?

LESSON IX.

1. If we plant 5 kernels of corn in one hill, in how many hills should we plant 45 kernels?

2. How many times 5 in 45? in 30? in 20?

3. Caroline has read 10 pages, in a book of 19 pages. How many pages has she yet to read?

4. 10 from 19 leaves how many? 10 from 20?

5. 16 chairs are placed in equal numbers on the 4 sides of a room. How many are on one side?

6. What is one fourth of 16? of 4? of 36?

7. There were 6 geese in the pond, and 6 others on the shore. What was the whole number?

8. How many are 6 and 6? 6 and 4? 6 and 9?

9. On a high mountain I found 7 eagles' nests, and in each nest, 2 eaglets. How many eaglets in all?

10. How many are 7 times 2? 7 times 4? 8?

11. If one writing desk accommodate 3 scholars, how many desks are required for 15 scholars?

12. How many times 3 in 15? in 9? in 27?

LESSON X.

1. How many are 3 and 3 and 3 and 3 and 3 and 3? Then 6 times 3 are how many? How many are 6 and 6 and 6? Then 3 times 6 are how many?

2. How many times 7 are there in 28? What is one seventh of 7? What is one seventh of 28?

3. How many times 4 are there in 28? What is one fourth of 4? What is one fourth of 28?

4. If we take 4 and 4 and 4 from 12, what will be left? Then how many times 4 are there in 12?

5. If we take 5 and 5 and 5 from 15, what will be left? Then how many times 5 are there in 15?

6. How many are 7 times 4? How many times 4 are there in 28? What is one fourth of 28?

7. How many are 8 times 5? How many times 5 are there in 40? What is one fifth of 40?

8. How many are 9 times 7? How many times 7 are there in 63? What is one seventh of 63?

9. What is one ninth of 9? How many times 9 are there in 90? What is one ninth of 90?

10. How many months have you been studying this FIRST PART of the North American Arithmetic? If you should be 3 times as long in the SECOND PART, when will you get through it?

END OF PART FIRST.

Note to Teachers. The SECOND PART of the North American Arithmetic is prepared especially to succeed the use of this little book, and may be regarded as an adequate standard book for common schools. It contains a complete system of Mental and Written Arithmetic, sufficiently extensive for all the purposes of common business. By excluding from the SECOND PART some of the higher operations, (to which very few scholars ever attain), room is found to treat the common subjects of Arithmetic very diffusely and clearly, without swelling the book to an objectional size and expense. No teacher need apprehend any difficulty in teaching from the SECOND PART, on account of being unacquainted with it; for the subject is made so plain, that learners will go through the book without requiring any aid from the teacher.

THE SCHOOL COMMITTEE OF BOSTON, by vote of November 18, 1834, have ordered, "that Emerson's North American Arithmetic, Second and Third Parts, be substituted for Colburn's First Lessons and Sequel." The First Part was adopted by a previous order.

This book should be returned to the Library on or before the last date stamped below.

A fine of five cents a day is incurred by retaining it beyond the specified time.

Please return promptly.

EMERSON'S SECOND PART.

Williams College, Oct. 2d, 1832.

To Mr. Frederick Emerson. Sir,—I have received the First and Second Parts of your North American Arithmetic; and am highly pleased with the plan of the work, and the manner of its execution thus far. It unites simplicity with fulness, and will thus be sure to interest the beginner, whilst it furnishes, at the same time, an ample guide to the more advanced pupil.

Respectfully and truly yours, ALBERT HOPKINS.

[*Professor of Mathematics and Natural Philosophy in Williamstown College.*]

Union College, Schenectady, Feb. 8th, 1833.

Mr. F. Emerson. Sir,—I have received the First and Second Parts of the North American Arithmetic, and examined them with pleasure. The relations of numbers are happily illustrated by the relations of sensible objects. This renders the work more entertaining and instructive, especially at that age to which arithmetic is better adapted than many of those studies which for want of a system like this are too often introduced. Here the student will acquire not merely rules to guide his hand, but principles to enlighten his understanding. He is not furnished with a mere mill for grinding numbers into a certain result under cover. Wishing you continued success,

I am, sir, respectfully, your ob't ser't, B. F. JOSLIN.

[*Professor of Mathematics and Natural Philosophy in Union College.*]

Burlington, 15th February, 1833.

[*Conclusion of a Letter to the Author.*] I should think it hardly possible that a child could be faithfully conducted through these two works, [First and Second Parts], without being vastly better acquainted with the subject than children formerly were. Being judiciously compelled in some measure to invent their own rules, they can scarcely fail of being able to assign a proper reason for the process, as well as to recollect it for future use. Indeed, I do not know any one particular in which, for the use of very young pupils, they could be improved. Yours respectfully,

JAMES DEAN.

[*Professor of Mathematics and Natural Philosophy, in the University of Vermont.*]

Athens, Ohio, February the 1st, 1833.

Mr. Emerson. Dear Sir,—I have carefully and attentively examined the "First and Second Parts" of "The North American Arithmetic;" and can say, with pleasure, that the work meets my cordial approbation. You have, perhaps, rendered Arithmetic as highly interesting to the youthful mind as the nature of the subject will admit. Your method of illustrating the fundamental principles of Fractions is clear, forcible, and peculiarly happy in its adaptation to the minds of youth.

I am, yours, &c. WILLIAM WALL.

[*Professor of Mathematics, in the Ohio University.*]